


|   |  |                      |                     |
|---|--|----------------------|---------------------|
|  | <b>J. J. White, Inc.</b><br><b>Training Toolbox Talk</b> | Doc Type:            | TBT - Training      |
|   |  | Issue Date           | Week 11 – 3/12/2018 |
| <b>Ammonia Awareness</b>  |  | Revision Date:       | 3/5/2018            |
|   |  | Revision No.         | 0                   |
|   |  | Next Review Date:    | 3/5/2019            |
| Preparation: V.P. HSE   | Authority: President                                     | Issuing Dept: Safety | Page: Page 1 of 4   |

## Purpose

The purpose of this procedure is to advise employees in areas where ammonia is being used and to provide information on an awareness level basis about the properties and hazards of ammonia, general guidelines and training requirements.

## Scope

This procedure applies to J. J. White, Inc. operations where employees whose work activities may involve working with or around ammonia. J. J. White employees do not directly work with ammonia; however, J. J. White employees may work in areas (ex: client roofs) where ammonia handling systems exist or where there is the likelihood to be released due to an emergency release or equipment failure. When work is performed on a non-owned or operated site, the operator's program shall take precedence, however, this document covers J. J. White, Inc. employees and contractors when an operator's program doesn't exist or is less stringent.

## Responsibilities

### Managers and Supervisors

- In coordination with the VP of HSE, develop and implement ammonia awareness training.
- Ensure personnel are aware of work that has the potential of exposure to ammonia.
- Identify possible locations where ammonia in the workplace may be used.
- Inform the VP of HSE (or designated JJW Site Safety Coordinator) of upcoming work involving ammonia, allowing the VP of HSE to provide any necessary monitoring or other required actions.
- Ensure employees comply with the ammonia awareness requirements.

### VP of Health, Safety, Environmental (HSE):

- Coordinate annual ammonia awareness training activities.

### Employees:

- Comply with the ammonia awareness requirements and direct any questions or concerns to the VP of HSE.
- Attend required annual training.

## Procedure


### Characteristics of Ammonia

#### Appearance

Ammonia is a colorless gas under normal conditions. It can be a liquid under pressure. It has a pungent, suffocating odor.

#### Description

Ammonia refers to solutions that are 50% ammonia or greater, ammonia anhydrous, and ammonia anhydrous liquefied, unless otherwise specified. Ammonia is a toxic gas or liquid that, when concentrated, is corrosive to tissues upon contact. Exposure to ammonia in sufficient quantities can

|   |  |                      |                     |
|---|--|----------------------|---------------------|
|  | <b>J. J. White, Inc.</b><br><b>Training Toolbox Talk</b> | Doc Type:            | TBT - Training      |
|   |  | Issue Date           | Week 11 – 3/12/2018 |
| <b>Ammonia Awareness</b>  |  | Revision Date:       | 3/5/2018            |
|   |  | Revision No.         | 0                   |
|   |  | Next Review Date:    | 3/5/2019            |
| Preparation: V.P. HSE   | Authority: President                                     | Issuing Dept: Safety | Page: Page 2 of 4   |

be fatal. One of the highest production-volume chemicals in the U.S., concentrated ammonia is used in manufacturing, refrigeration, and agriculture (as a fertilizer). Household ammonia is much less concentrated; it rarely causes burns, but it does cause irritation. The lowest level at which humans can detect the odor of ammonia (odor threshold) generally provides sufficient warning of exposure; however, persons with prolonged exposure to ammonia will lose their ability to detect the odor (olfactory fatigue). Ammonia commonly exists as part of a solution.

### Health Effects

Some of the potential health effects of ammonia such as burning of the eyes, temporary blindness, coughing, chest pain, etc. Exposure of the eyes to ammonia may cause burning, tearing, temporary blindness and severe eye damage. Exposure of the skin to ammonia may cause severe burns and blistering. Exposure of the respiratory tract (mouth, nose and throat) to ammonia may cause runny nose, coughing, chest pain, severe breathing difficulties, severe burns and death.

Ammonia may be found at particular J. J. White work locations, primarily facilities utilizing ammonia as a refrigerant gas. Ammonia is normally handled in closed systems with exposure only occurring when making openings in lines or related equipment for repairs. Exposure may also be encountered should a leak develop. Possible ways employees may be exposed to ammonia during their job functions can include, but are not limited to:


- Working on/near industrial refrigeration machinery rooms, equipment and/or piping.
- Working in petroleum refineries.
- Process areas that contain NH<sub>3</sub> (mechanical rooms, ventilation systems, piping systems).
- Equipment or process releases/emergencies/leaks.
- Roof areas with ammonia handling systems designed to transport ammonia across a facility.
- Breaking/opening of lines or equipment that contained ammonia.
- Working with/near agricultural fertilizer.

### Methods of Dissemination:

- Indoor Air: Ammonia can be released into indoor air as a liquid spray (aerosol) or as a vapor.
- Water: Ammonia can be used to contaminate water.
- Food: Ammonia is unlikely to contaminate food due to unpalatable qualities rendered to food.
- Outdoor Air: Ammonia can be released into outdoor air as a liquid spray (aerosol) or as a vapor.
- Agricultural: If ammonia is released into the air as a liquid spray (aerosol), it has the potential to contaminate agricultural products. If ammonia is released as a vapor, it is highly unlikely to contaminate agricultural products.

### Routes of Exposure

Ammonia can cause harm if inhaled and/or if it comes into contact with the eyes or skin. High concentrations of ammonia gas, liquid ammonia and solutions of ammonia can cause harm if inhaled or if they come into contact with eyes or skin.

|   |  |                      |                     |
|---|--|----------------------|---------------------|
|  | <b>J. J. White, Inc.</b><br><b>Training Toolbox Talk</b> | Doc Type:            | TBT - Training      |
|   |  | Issue Date:          | Week 11 - 3/12/2018 |
| <b>Ammonia Awareness</b>  |  | Revision Date:       | 3/5/2018            |
|   |  | Revision No.:        | 0                   |
|   |  | Next Review Date:    | 3/5/2019            |
| Preparation: V.P. HSE   | Authority: President                                     | Issuing Dept: Safety | Page: Page 3 of 4   |

Ammonia vapor leaks must be reported immediately to a process operator or designated personnel as defined in the sites emergency action plan. Before working in ammonia atmospheres, personnel must obtain permission from the site process supervisor and be properly instructed and protected to assure safety.

**Pre-Job Planning for Ammonia Related Work**

Pre-job planning or a site assessment will be conducted prior to starting work and that assessment will be documented. Employees shall review the site's SDS's for systems containing ammonia. Documented planning will be conducted for those operations involving potential ammonia exposure and this includes anytime an active purge is being applied to a system in or around equipment associated with work. Some planning or assessment elements include:


- All proposed work requires a jobsite visit by the requestor and a unit operator to identify special precautions, equipment status and personal safety equipment requirements. Be aware that ammonia area monitors may be installed in work areas that contain ammonia. Employees shall be able to recognize area monitor alarms.
- The permit must clearly identify all hazards and special personal protective equipment requirements.
- Appropriate signage will be utilized and adhered to. Appropriate signage will include adequate warning as seen below.



**Personal Protective Equipment**

J. J. White, Inc. employees will use impervious clothing, gloves and/or face shields if there is a possibility of skin contact with liquid ammonia or vessels containing liquid ammonia. Employees will be provided with and required to use impervious clothing, gloves, face shields and other appropriate protective clothing necessary to prevent any possibility of skin contact with liquid anhydrous ammonia or aqueous solutions of ammonia containing more than 10% by weight of ammonia. Similar precautions should be taken to prevent the skin from becoming frozen from contact with vessels containing liquid anhydrous ammonia. Any clothing that becomes wet with liquids containing ammonia should be removed immediately and not re-worn until the ammonia has evaporated and the clothes washed.

Only an NIOSH certified positive pressure/pressure demand breathing equipment such as the MSA Self-Contained Breathing Apparatus and the Work Mask supplied by large cylinders of breathing air

|   |  |                      |                     |
|---|--|----------------------|---------------------|
|  | <b>J. J. White, Inc.</b><br><b>Training Toolbox Talk</b> | Doc Type:            | TBT - Training      |
|   |  | Issue Date:          | Week 11 – 3/12/2018 |
| <b>Ammonia Awareness</b>  |  | Revision Date:       | 3/5/2018            |
|   |  | Revision No.:        | 0                   |
|   |  | Next Review Date:    | 3/5/2019            |
| Preparation: V.P. HSE   | Authority: President                                     | Issuing Dept: Safety | Page: Page 4 of 4   |

(and equipped with an egress cylinder) may be used in atmospheres containing undetermined or high concentrations of ammonia gas. It is J. J. White's policy to implement engineering controls to reduce or eliminate employee exposure before using respiratory protection.

### Spill and Leak Procedures

Persons not wearing protective equipment and clothing must be restricted from areas of spills or leaks until cleanup has been completed. If an ammonia spill or leak occurs, the following procedure should be followed:

- Evacuate and clear the area of personnel. Recognize applicable onsite alarms that may indicate a release has occurred and evacuation is required.
- Discontinue any hot work operations in or near the release area.
- Inform the appropriate process operators/personnel of the release or make the proper notifications by calling the emergency number at the site.
- No one should enter the area until it is safe to enter. Authorization must be granted by the appropriate site process personnel/operator.

### Training

---

Employees will be aware of provisions of site specific contingency/emergency plans. Employees will be aware of owners' contingency plans and provisions. Employees must be informed where ammonia is used in the host facility and aware of additional plant safety rules.

J. J. White, Inc. shall provide training for all affected employees including any J. J. White, Inc. employee working with or near ammonia and the training shall emphasize:

- The characteristics of ammonia.
- The hazards of ammonia.
- Proper PPE.
- Owner client requirements.

Documentation of training - Ammonia awareness training shall be documented including dates of training, location of training, employee name and trainer name.

